NRC·CNRC
Institute for Research in Construction

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# construction *innovation*

## Researchers study characteristics of combustible materials in retail buildings

A recently completed joint research project involving NRC-IRC and Carleton University addressed a recognized short-fall of data on combustible materials (contents) found in retail buildings.

The results of such studies are of particular benefit to fire-safety engineers in helping them make better estimates of the main features of a fire to be used in computer models. Such features include the rate of heat production, or heat release rate (HRR); temperature; and fire effluent (smoke and combustion gases such as carbon dioxide and carbon monoxide). Heat release rate, which is measured in units of kilowatts (kW), is an important indicator of the size of a fire as well as its destructive potential.

In this study, reduced-scale experiments were conducted in NRC-IRC's test facilities. The test rooms were constructed with non-combustible materials and had a single door-sized opening to allow for the inflow of fresh air and outflow of smoke. The composition of the combustible materials used in the experiments was determined from a survey conducted by Carleton University, which covered 168 small- to medium-sized stores in Ottawa and neighbouring Gatineau. The stores were located on the first two storeys of high-rise office buildings or in purpose-built retail buildings of less than three storeys.

Clothing fires developed rapidly.

Plastic and rubber products produced dense smoke.

The experiments were conducted with various quantities of combustible materials weighing between 30 kg and 600 kg and with various arrangements of combustible materials. These arrangements simulated layouts typically found in stores specializing in computers, clothing, toys, shoes and books, and in fast food restaurants.

The results revealed varied burning characteristics of the different combustible materials, with peak heat release rates ranging from 400 kW to 2,800 kW and temperatures exceeding 1100°C at the ceiling. An HRR value of 1,500 kW was sufficient to cause flashover—a dangerous stage in the growth phase of a fire. Flashover occurs when all of the exposed surfaces of combustible materials are ignited due to elevated room temperatures exceeding a critical value. Once flashover has occurred, the

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### *Highlights*

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Read *Construction Innovation* on the Web at **http://irc.nrc-cnrc.gc.ca/ci**

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# CCBFC looking at how to add new objectives to the codes

At the 20th meeting of the Canadian Commission on Building and Fire Codes (CCBFC) held in February 2008, the CCBFC approved the formation of a task group to determine how requests for the addition of new objectives to the national model codes should be addressed.

Currently, the requirements of the codes set minimum acceptable levels of performance related to one of four approved objectives: safety, health, accessibility and the protection of property. However, there are potential new objectives being brought forward that are not related to these four objectives and for which there are no requirements in the codes at present. The task group's work is to develop a protocol for considering the addition of new objectives to the codes.

If you are interested in receiving more information on the progress of this project or in participating, please contact Anne Gribbon at 613-993-5569, fax 613-952-4040, or e-mail anne.gribbon@nrc-cnrc.gc.ca.

## Second Series of Revisions and Errata to 2005 National Construction Codes Now Available!

The second series of revisions and errata have been issued for the following 2005 national construction code documents:

- National Building Code of Canada 2005;
- National Fire Code of Canada 2005;
- National Plumbing Code of Canada 2005;
- User's Guide – NBC 2005, Structural Commentaries (Part 4 of Division B).

Revisions are issued between code cycles to promptly address health- or safety-related matters, among others, and are approved by the Canadian Commission on Building and Fire Codes. Errata are corrections that facilitate the use of code documents. Code users should contact their local authority having jurisdiction to find out if these revisions and errata apply in their province or territory.

The second series of revisions and errata have been added to the tables prepared for the first series of revisions and errata released in December 2007 to form a comprehensive document. They are identified in the "Date of Issue" column with the date "08-06-20." The tables along with selected replacement pages can be viewed, downloaded and printed from the Internet at http://irc.nrc-cnrc.gc.ca/pubs/codes/revisions_e.html. The replacement pages are identified in the footer with "(Updated page 08-06-20)."

Clients who purchased a publication on CD-ROM will receive instructions by fax on the procedure to follow to update their electronic documents with the second series of revisions and errata.

For further information, please contact NRC-IRC's Publication Sales Department:

Tel.: 1-613-993-2463 or 1-800-672-7990
Fax: 1-613-952-7673
E-mail: IRCpubsales@nrc-cnrc.gc.ca

## Newsbrief

### Updating the Model National Energy Code for Buildings (MNECB)

The Canadian Commission on Building and Fire Codes (CCBFC) has created the Standing Committee on Energy Efficiency in Buildings (SCEEB) to update the technical provisions of the MNECB 1997 (see *Construction Innovation*, September 2007).

The standing committee held its first meeting in December 2007 in Ottawa. The purpose of the meeting was two-fold:

- to explain the policies and procedures of the CCBFC to the members.
- to formulate a work plan for submission to the February 2008 meeting of the CCBFC.

At the meeting the standing committee agreed:

- to limit the current work plan to their mandate of updating the matters addressed in the MNECB 1997.
- to limit the update to address energy efficiency as that (energy) used by the building and not to directly address other related issues such as energy conservation and sustainability, which are likely to be added benefits of the updated provisions.
- to address only energy efficiency, removing the economic aspects from the provisions of the revised Code.

In order to address the technical updating, the standing committee has established six working committees to do the analysis and recommend technical changes. These committees are as follows:

- Task Group on Electrical Power and Lighting
- Task Group on Building Envelope
- Task Group on HVAC and Service Water Heating Systems
- Task Group on Building Energy Performance Compliance
- Task Group on Code Consolidation
- Working Group on Referenced Standards

The next steps will involve addressing the objective-based analysis of the MNECB 1997 to establish the objectives for the updated Code, scheduled to be published in 2011.

If you are interested in receiving more information on the progress of this standing committee, please contact Cathy Taraschuk at 613-993-0049, fax 613-952-4040, or e-mail cathleen.taraschuk@nrc-cnrc.gc.ca.

# Public review for the 2010 national model codes to take place in Fall 2008

The Canadian Commission on Building and Fire Codes (CCBFC) invites the public to take part in its annual review of proposed changes to the national model codes (National Building Code of Canada, National Fire Code of Canada and National Plumbing Code of Canada). The annual public review is an important step in the process for developing the codes, providing the public with the opportunity to take a detailed look at proposed changes and comment on each one as to whether it should be approved, altered, or rejected.

The public review of the changes proposed for the 2010 version of the codes will run from September 29, 2008 until November 28, 2008 using the national codes Web site www.nationalcodes.ca. A link will be provided on the Web site to the instructions on how to submit comments.

More information on the public review and how to participate will be available in the September issue of *Construction Innovation*.

If you are interested in receiving more information on the public review, please contact Anne Gribbon at 613-993-5569, fax 613-952-4040, or e-mail anne.gribbon@nrc-cnrc.gc.ca.

# Task group formed to review code requirements on protection against radon ingress

Health Canada estimates that radon in Canadian homes is responsible for 1,900 deaths a year in Canada and it has therefore made its guideline for the acceptable indoor concentration of radon in homes more stringent by reducing the concentration from 800 Bq/m$^3$ to 200 Bq/m$^3$. (Bq, or becquerel, is a measure of radon activity.)

*The task group will review current requirements and assess the level of protection from radon ingress provided by construction that complies with those requirements and, if necessary, recommend changes.*

This new guideline has raised questions as to whether current acceptable solutions in Part 5 and Part 9 of the National Building Code are still adequate to protect occupants from the ingress of radon and whether they provide viable compliance options for builders and designers.

The Canadian Commission on Building and Fire Codes (CCBFC) has approved a request from two standing committees to strike a joint task group, consisting of members representing affected stakeholder groups. The task group will review current requirements and assess the level of protection from radon ingress provided by construction that complies with those requirements and, if necessary, recommend changes.

If you are interested in receiving more information on the progress of this task group, please contact Frank Lohmann at 613-993-9599, fax 613-952-4040, or e-mail frank.lohmann@nrc-cnrc.gc.ca.

## Codes upcoming events

**October 2-3**

Meeting of the Task Group on HVAC and Service Water Heating Systems. Halifax.

Contact:
Diane Green at 613-993-0046,
E-mail: diane.green@nrc-cnrc.gc.ca

**October 20-21**

Meeting of the Standing Committee on Building and Plumbing Services. Ottawa.

Contact:
Diane Green at 613-993-0046,
E-mail: diane.green@nrc-cnrc.gc.ca

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# New CCMC report formats

In 2005, the National Building Code (NBC) switched to an objective-based format based on objectives and functional statements. In response to this change and to industry concerns regarding its evaluation process and guidelines, the Canadian Construction Materials Centre (CCMC) made adjustments to the evaluation process (see *Construction Innovation*, December 2007) as well as to its report format, which are summarized here.

CCMC publishes three types of document on its Web site that give different kinds of information on products and on how they relate to the NBC:

- The **CCMC Report**, which provides an opinion on compliance of the product or system evaluated to the NBC (or a provincial code). The CCMC opinion is based on whether a product complies with the code acceptable solutions in Division B or whether it is an alternative to the code solutions. (Note: some systems may have components that comply with the code acceptable solutions, but the system in which these components perform together is considered to be an "alternative" solution.) Go to http://irc.nrc-cnrc.gc.ca/ccmc/registry/06/181/13200_e.pdf for an example of a CCMC Report.
- The **CCMC Listing**, which is issued for products that have demonstrated compliance with recognized standards. Listings do not provide an opinion on NBC compliance. Go to http://irc.nrc-cnrc.gc.ca/ccmc/registry/07/481/13299_e.pdf for an example of a CCMC Listing.
- The **CCMC Preface** (to Listings), which provides a summary of the key items in a standard (such as scope, technical requirements and administrative requirements) for which a Listing has been issued. It should be read in conjunction with the Listing it concerns. A Preface does not provide an opinion on NBC compliance, but does contain a section that provides the reference to the standard in the NBC. Go to http://irc.nrc-cnrc.gc.ca/ccmc/registry/07/preface/07541_e.pdf for an example of a CCMC Preface.

Each of these three documents follows a set format, with similarities in the organization.

- The **CCMC Report** contains five sections:
  - Section 1 provides a CCMC opinion on whether the product complies with the NBC.
  - Section 2 provides a general description of the product that was evaluated.
  - Section 3 outlines the conditions and limitations of the evaluation as well as the limitations on the use of the product.
  - Section 4 outlines the technical data associated with the product or system. CCMC uses the data under 4.1 as the basis of the opinion. All additional data are either requested by the proponent or related to health and safety issues not addressed by the Code. In specific jurisdictions, the additional data may be required by the regulatory authority.
  - Section 5 provides administrative and contact information.
- The **CCMC Listing** includes four sections and should be read in conjunction with the Preface:
  - Section 1 states the standard used for the evaluation of the product.
  - Section 2 provides a general description of the product that was evaluated.
  - Section 3 provides additional information on the standard, as well as any relevant regulatory information.
  - Section 4 provides administrative and contact information.
- The **CCMC Preface** includes four sections and should be read in conjunction with the Listing:
  - Section 1 summarizes the standard's scope.
  - Section 2 provides a summary of the standard's technical requirements, often in table format.
  - Section 3 outlines the standard's labelling requirements.
  - Section 4 provides the standard's specific reference in the NBC. If it is not referenced in the NBC, it is stated as such.

*It is important to note that CCMC does not approve, endorse or certify construction products or systems.*

It is important to note that CCMC does not approve, endorse or certify construction products or systems. CCMC offers an opinion on whether a product complies with the NBC only for innovative non-standard products or systems. The fact that CCMC has issued a Listing for a product does not mean it complies with the NBC—CCMC can issue Listings on standards developed by other organizations (e.g., ASTM or ISO), many of which are not cited in the NBC. By consulting the Preface and the NBC, the user of a Listing should determine any additional requirements that are needed for compliance to the Code. CCMC Reports and Listings are valid as long as they are published on the CCMC Web site, which is the location of the official registry: http://irc.nrc-cnrc.gc.ca/ccmc/index_e.html.

For more information on the changes to the CCMC evaluation process and the new report format, please contact Dr. John Flack at 613-990-8518, fax 613-952-0268, or e-mail john.flack@nrc-cnrc.gc.ca.

# Call for candidates to serve on the CCCME's technical evaluations committee

NRC-IRC is seeking candidates to serve on the Standing Committee on Technical Evaluations (SCTE) of the Canadian Commission on Construction Materials Evaluation (CCCME).

This committee assists the CCCME in fulfilling its overall responsibility to NRC-IRC for the quality and reliability of CCMC's technical evaluation methods. The members review and comment on Technical Guides and other documents developed by CCMC for the evaluation of innovative products. The SCTE review process is conducted through a private Web site.

In terms of their review, the members are expected, within the limits of their experience and knowledge, to comment on whether or not the technical requirements set out in the Guides adequately demonstrate compliance with the National Building Code of Canada. For example, they could make comments on technical omissions, the selection of better test methodologies to be used, or on whether a proposed criterion is too stringent or too permissive relative to the Code or accepted industry practice. The final approval and ultimate responsibility for the documents reviewed by the committee rests with CCMC.

Members are expected to exercise broad objective judgements and are chosen for their individual experience and abilities rather than as delegates or representatives of any particular association or group.

SCTE members are appointed by NRC-IRC. While such appointments do not come with any remuneration, travel and accommodation expenses incurred in attending committee meetings, typically held once every three years, are reimbursed by NRC-IRC. The term of appointment is normally three years. New appointments and re-appointments will be effective November 1, 2008.

Those interested in serving on the SCTE should submit a résumé with details of their personal history by **August 31, 2008** to:

Caroline St-Onge, Eng.
Secretary, SCTE
Institute for Research in Construction, Building M-24
National Research Council of Canada
1200 Montreal Road
Ottawa, Ontario K1A 0R6

Tel: 613-998-4625
Fax: 613-952-0268
E-mail:
caroline.st-onge@nrc-cnrc.gc.ca

For more information on CCMC and CCCME please go to:
http://irc.nrc-cnrc.gc.ca/ccmc/index_e.html

# New product evaluations

| Company | Product Name | CCMC # | Description |
|---|---|---|---|
| Firestone Building Products Canada | RubberGard Non-reinforced EPDM Membrane | 13305L | Elastomeric sheet membrane roofing |
| Therm-O-Comfort Company Limited | Therm-O-Light Type 2 | 13306L | Cellulose fibre insulation |
| Louisiana-Pacific Corporation | LP SolidStart® OSB Rim Board and Rim Board Plus | 13308L | Wood-based rim board for floors |
| Cliffcorp Inc. – The Footing Tube | The Footing Tube | 13309R | Plastic pier and footing forms |
| Roseburg Forest Products Co. | RigidLam® LVL | 13310R | Structural composite lumber |
| Nexus Building Products | Basement Window | 13311L | Plastic windows |
| Carlisle SynTec Canada | Sure-Flex PVC | 13312L | Polyvinyl chloride roofing and waterproofing membrane |
| Metro Roof Products | Metro Roofing Panels | 13313R | Metal roofing systems |
| Synergy Pacific Engineered Timber Ltd. | QuattroPost™ | 13314R | High-shear strength glulam |

For further information on the performance, usage and limitations of these products, as well as for other reports and listings by CCMC, see the Web Registry of Product Evaluations located at **http://irc.nrc-cnrc.gc.ca/ccmc/regprodeval_e.html**.

# NRC-IRC develops evaluation protocol for innovative vapour barrier

Poor vapour control between the interior and exterior environment of a building can have expensive consequences from the build up of condensation inside walls. This can cause materials to deteriorate, lead to occupant discomfort, and increase energy consumption.

To prevent these problems, builders normally install a vapour barrier (see sidebar) as a control on how much water vapour can diffuse through the surface enclosing a space and as a way to prevent moisture from travelling to a point in the wall where it may condense.

Vapour barriers were originally intended to keep building assemblies from getting wet, but they can sometimes end up preventing assemblies from drying out. An innovative new product to manage moisture accumulation in the building envelope, however, may be able to address both issues: while the product acts as a vapour barrier under most conditions, it also allows excess moisture to escape.

The Canadian Construction Materials Centre (CCMC) set out to determine whether this product can serve as a vapour barrier and an air barrier system and whether it conformed to the intent of applicable building code requirements. In collaboration with NRC-IRC researchers, CCMC developed a testing protocol for its evaluation, which was based on laboratory testing requirements for vapour diffusion, air leakage control and durability. Because of the product's varying water vapour permeance, CCMC also required computer modelling to verify compliance with the National Building Code.

For the computer modelling, researchers in NRC-IRC's Building Envelope and Structure program provided the expertise, using their hygrothermal modelling tool, *hyg*IRC 2-D. This tool creates a computational model of a building and subjects it to hourly temperature, relative humidity, solar radiation, and wind and rain variations on the outside, and temperature and humidity variations on the inside. It then simulates the building's responses to the changing environmental conditions, producing information on temperature and relative humidity distributions within the envelope assembly and how they will change with time.

A vapour barrier is generally composed of a layer of material (such as polyethylene film) used to retard or prevent the diffusion of moisture into a wall, ceiling or floor.

The researchers were able to demonstrate that the product performed well in all locations (they simulated a wood-framed stucco wall system, exposing it to the climate of four separate Canadian locations, both coastal and non-coastal), and in interiors with both high and low relative humidity. One problem it uncovered with the product occurred when it was used in conjunction with acrylic paint on indoor walls. Latex paints are recommended to capitalize on this material's variable properties.

Based on NRC-IRC's experimental and modelling research results, CCMC has published an evaluation report (CCMC 13278-R) on the product, known as MemBrain™, for consideration by building officials.

The report provides CCMC's opinion, the test results on which the opinion is based, and usage conditions and limitations for the product. It stipulates that the product can serve as an alternative to polyethylene film and be used both as a vapour barrier and as an air barrier system within a building's exterior walls—except in buildings with high indoor relative humidity such as saunas and swimming pools.

For more information, contact Dr. Wahid Maref at 613-993-5709, fax 613-998-6802, or e-mail wahid.maref@nrc-cnrc.gc.ca. The complete results of the CCMC evaluation are also available at http://irc.nrc-cnrc.gc.ca/ccmc/registry/07/219/13278_e.pdf.

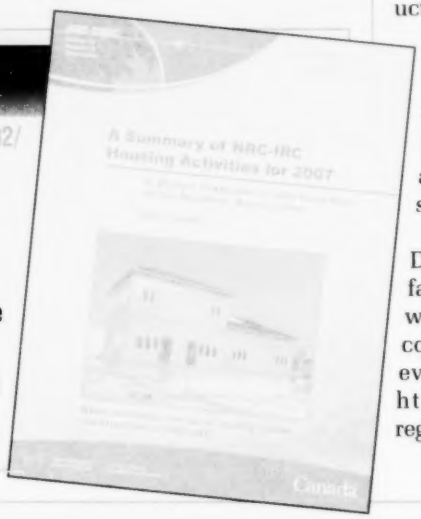
## Housing Report Available

http://irc.nrc-cnrc.gc.ca/pubs/fulltext/nrcc50092/

NRC-IRC is pleased to announce the availability of the following report on its Web site:

**A Summary of NRC-IRC Housing Activities for 2007: A Report Prepared for the Canadian Home Builders' Association, April 2008**

This report summarizes NRC-IRC housing-related activities for the year 2007, including research, code development and product evaluation.



# Nanotechnology makes contribution to sustainable concrete construction

Portland cement is an energy-intensive material whose manufacture also releases large volumes of carbon dioxide ($CO_2$)—over 0.85 tonnes for every tonne of cement used. Because of the increasing concern about climate warming, industry is seeking ways to reduce these environmental impacts.

There are three key actions that can be taken to achieve this: 1) reducing the amount of concrete needed for a construction project (good system design) 2) reducing the amount of cement used in making the concrete (good specification) and 3) reducing the amount of clinker (good material design) needed to make the cement. This can be achieved by adding substitute cementious materials (SCMs) and other materials, such as ground limestone ($CaCO_3$). However, the addition of these materials has an impact on concrete properties.

*The results from early studies indicate that the addition of nano-sized $CaCO_3$ allows greater amounts of SCMs to be used in the concrete without causing much delay in early hydration or reduction of the initial strength development of concrete.*

The use of SCMs as a partial replacement of ordinary Portland cement (OPC) in concrete can help reduce $CO_2$ emissions, and save energy and natural resources. But one of the major disadvantages to this approach is that some SCMs, including fly ash and slag, can delay the early hydration of OPC and thus slow down the initial strength development of concrete. This can be a serious shortcoming in the context of tight construction schedules in a competitive industry.

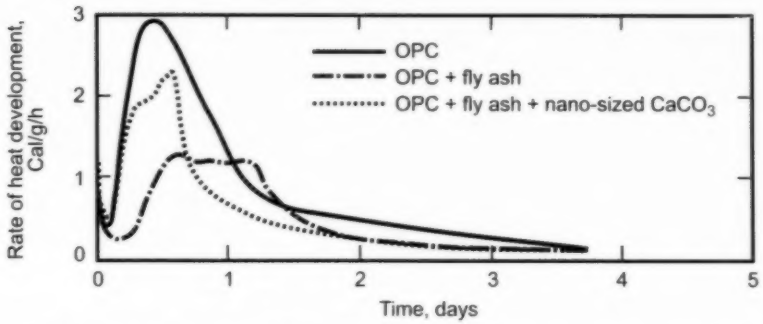



**Figure 1. Rate of heat development of OPC, OPC containing high volumes of fly ash, and OPC containing high volumes of fly ash plus nano-sized ground limestone.**

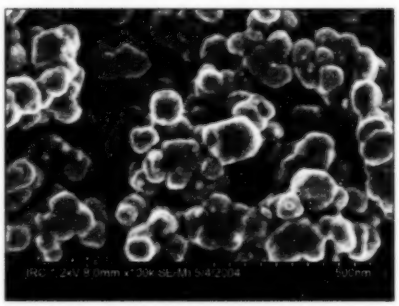


**Figure 2. Scanning electron microscope image of nano-sized ground limestone**

One approach that has been taken as a way of addressing this problem is to use ground limestone to replace a certain portion of the OPC in the concrete. The addition of ground limestone has a positive effect on the hydration of cement paste—especially its accelerating effect on the rate of hydration—and on the strength development of hardened concrete. Past studies have indicated that the finer and greater the amount of ground limestone, the greater the accelerating effect.

Nanotechnology is the engineering of materials and structures to take advantage of their behaviour at scales of 1–100 nanometres (a nanometer is one billionth of a metre).

NRC-IRC is currently studying the potential of using nano-sized ground limestone to accelerate the hydration of OPC. The results from early studies indicate that the addition of nano-sized $CaCO_3$ (see Figure 1) allows greater amounts of SCMs to be used in the concrete without causing much delay in early hydration or reduction of the initial strength development of concrete.

The researchers will also investigate other possible effects of using nano-sized $CaCO_3$, such as changes in the volume of the hardened cement paste or in the consistency of the concrete mix.

NRC-IRC is seeking partners for this research project. If you are interested in participating, please contact Dr. Taijiro Sato at 613-993-0089, fax 613-954-5984, or e-mail taijiro.sato@nrc-cnrc.gc.ca or visit http://irc.nrc-cnrc.gc.ca/nano/index_e.html.

# Building Science Insight 2008/09

NRC · CNRC

www.bsi.gc.ca

**Organized by: Institute for Research in Construction**
**National Research Council Canada**

## Single and multi-family houses: improving performance through a systems approach

Building Science Insight is a national seminar series presented by the National Research Council of Canada Institute for Research in Construction to provide construction professionals with practical information. Each seminar focuses on technical advances related to a specific topic and includes the results of recent NRC-IRC research.

This year's seminar "Single and multi-family houses: improving performance through a systems approach" will address a number of different issues:

***Performing Basement Systems Part 1: Managing the Water****

Proper site grading and foundation drainage are required in order to prevent water damage to basements and their contents. NRC-IRC researchers will review current construction practices for basements, examine why problems occur, and provide practical suggestions for improving drainage and construction.

*This topic will not be presented in Yellowknife, Whitehorse or Iqaluit.*

***Performing Basement Systems Part 2: Managing Heat and Moisture****

The basement envelope is subjected to highly variable water and moisture loads. This talk will look at emerging techniques and recommended approaches for managing moisture in wall assemblies for basements with living space.

*This topic will not be presented in Yellowknife, Whitehorse or Iqaluit.*

***Building Envelopes for Canada's Arctic Regions***

NRC-IRC has undertaken a study to develop exterior wall systems that will perform effectively under the extreme conditions prevailing in the coldest and most remote parts of Canada. This presentation will report on the study's progress and discuss the next steps.

*This topic will be presented only in Yellowknife, Whitehorse and Iqaluit.*

***Sound Isolation in Wood-Frame Construction***

Occupant satisfaction with the sound isolation between units is determined by the complex interaction of the separating wall or floor and all the building elements connected to those assemblies. This session will show designers how to choose elements that prevent significant structure-borne sound transmission from by-passing the separating wall.

***Fire Stops and Fire Blocks***

In order to ensure good performance of complete building systems, designers and builders must use a systems approach that meshes the requirements for both sound and fire control. This presentation will address fire stops and fire blocks in the context of Canadian codes and standards, illustrate possible designs for fire stops at junctions and penetrations, and provide guidance on corresponding acoustical issues.

***Ventilation Strategies and Evaluations***

Ventilation has a critical influence on indoor air quality and thermal comfort. This session will present a number of ventilation strategies available to designers. In addition, evaluation techniques will be reviewed to help practitioners choose the most effective strategies for their projects.

***Natural Ventilation in Canadian Houses – Assessment and the View Ahead***

This presentation focuses on the role of infiltration as a means of improving indoor air quality. Researchers will show how simple computer simulation tools can determine whether air leakage alone can meet the ventilation needs of houses in various Canadian climate zones. They will also present data based on existing building stock with a view to guiding future improvements in house ventilation.

***Canadian Centre for Housing Technology (CCHT)***

More than 30 different housing technologies ranging from fluorescent light bulbs and windows to natural gas-fired engines and a fuel cell have been assessed at CCHT's twin research houses. This presentation outlines the main features of the CCHT facilities and presents a brief overview of recent experiments conducted there.

***CCHT Case Study on Glazing, Part I Field Trial***

In this presentation researchers will describe a series of experiments conducted at CCHT to examine the impact of different window glazing technologies on energy consumption, room temperatures, window-surface temperatures, and the transmission of solar radiation.

***CCHT Case Study on Glazing, Part II Application and Practical Considerations***

This presentation discusses how the results of the glazing experiment were used to refine the HOT2000™ computer simulation tool, and describes the energy performance of the two glazing systems studied in the experiment, as well as that of a conventional double-glazed clear-glass system, in various Canadian climate zones.

***Speakers***

The roster of speakers includes NRC-IRC building science specialists J. David Quirt, Iain A. MacDonald, Marianne M. Armstrong, Hakim Elmahdy, Michael C. Swinton, Trevor R. Nightingale, Wahid Maref, James T. Reardon, Boualem Ouazia and building science generalist Luc Saint-Martin.

Registrants will receive copies of NRC-IRC's recent publications *Guide for Sound Insulation in Wood Frame Construction*, the *Best Practice Guide for Fire Stops and Fire Blocks and Their Impact on Sound Transmission*, and *Performance Guidelines for Basement Envelope Systems and Materials*.

*This one-day seminar will be held in the following locations:*

### English Seminars

- ***Yellowknife, Oct. 1, 2008***
- ***Edmonton, Oct. 3, 2008***
- ***Vancouver, Oct. 6, 2008***
- ***Whitehorse, Oct. 8, 2008***
- ***Toronto, Nov. 4, 2008***
- ***Iqaluit, Nov. 6, 2008***
- ***Winnipeg, Nov. 17, 2008***
- ***Calgary, Nov. 19, 2008***
- ***Saskatoon, Nov. 21, 2008***
- ***St. John's, Dec. 2, 2008***
- ***Halifax, Dec. 4, 2008***
- ***Moncton, Jan. 13, 2009****
- ***Ottawa, Jan. 15, 2009****

### French Seminars

- ***Quebec, Feb. 3, 2009***
- ***Montreal, Feb. 5, 2009****

** With simultaneous translation*

*The registration for the seminar is $349 plus tax. Please visit the Web site at **www.bsi.gc.ca** for more details and registration information.*

# Major initiative to assess Canada's core public infrastructure

Infrastructure Canada and NRC-IRC have signed a Memorandum of Understanding (MOU) with Engineers Canada, representing members of the National Round Table on Sustainable Infrastructure (NRTSI), to undertake a collaborative research project to assess the state, performance and management of Canada's core public infrastructure.

*"This initiative is an example of how, through its Building Canada plan, the Government of Canada is working with all levels of government and the private sector to ensure that Canada's public infrastructure supports a stronger economy, a cleaner environment and more prosperous, safer communities," says The Honourable Lawrence Cannon, Minister of Transportation, Infrastructure and Communities.*

Over the duration of this MOU, NRC and Engineers Canada will establish nation-wide scientific and engineering methods and tools to measure the state, performance and management of core public infrastructure (namely bridges, roads, public transit, potable water and wastewater systems). These methods are expected to yield reliable quantitative information on the physical condition, performance, risk of failure, life-cycle costs, and remaining service life of core public infrastructure.

The Honourable Lawrence Cannon, Minister of Transportation, Infrastructure and Communities, notes that "this initiative is an example of how, through its Building Canada plan, the Government of Canada is working with all levels of government and the private sector to ensure that Canada's public infrastructure supports a stronger economy, a cleaner environment and more prosperous, safer communities."

The development of these tools will respond to local and regional infrastructure needs, and enhance Canada's collective knowledge about its infrastructure, while advancing national priorities that are important to all Canadians. This project consists of the development of the *Framework for the Assessment of State, Performance and Management of Canada's Core Public Infrastructure*.

Government of Canada funding for this initiative comes from Infrastructure Canada's Knowledge, Outreach and Awareness Program.

## *Researchers study characteristics of combustible materials in retail buildings*

*Continued from cover page*

potential for damage and fatalities in adjacent rooms is greatly increased.

The main observations from this work were as follows:

- The fuel packages with high plastic, rubber and edible-oil content attained high peak HRRs and exhibited fast fire growth and significant smoke production.
- Computer equipment exhibited slow fire growth; however, very dense smoke was produced as a consequence of the type of plastics used in the manufacture of the casings.
- The clothing fires produced the lowest amount of smoke; however, the light fabrics promoted rapid upward flame spread.

For more information about this study, please contact Dr. Alex Bwalya at 613-993-9739, fax 613-954-0483, e-mail alex.bwalya@nrc-cnrc.gc.ca, or visit http://irc.nrc-cnrc.gc.ca/pubs/ir/ir868/ and http://irc.nrc-cnrc.gc.ca/pubs/rr/rr236/ to obtain the detailed reports.

## *Building Science Insight* now on the Web

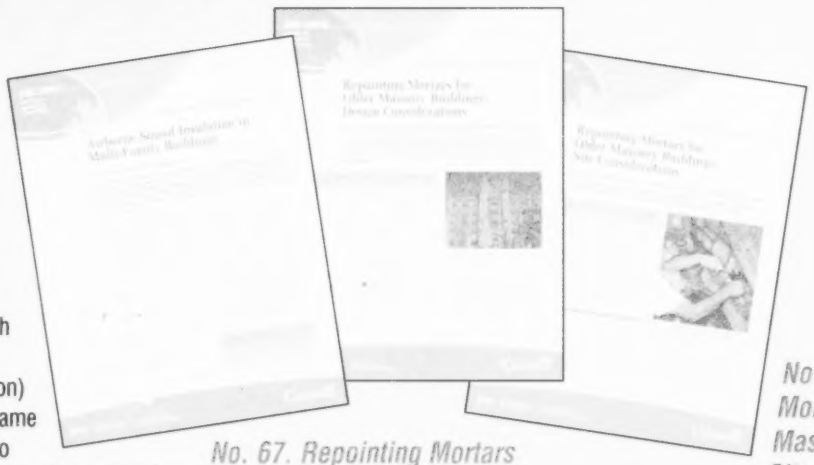
NRC-IRC is pleased to announce that Webcasts of our two most recent BSI seminars, BSI 2006 on **Sustainable Infrastructure** and BSI 2007 on **Fire Safety Research for Better Building Design**, are now available. These consist of complete audio and visual records of each presentation, allowing anyone anywhere, at any time, to stay current with developments in construction research in these areas.

Versions of the BSI 2006 and 2007 seminars are now available for a nominal fee at **http://irc.nrc-cnrc.gc.ca/webcasts_e.html**. The price of each online seminar is $125.

A Webcast of BSI 2008/09 will also be made available in the spring of 2009.

# Three New Updates Available

**NRC-IRC is pleased to announce that three new Construction Technology Updates have been published:**



## *No. 66. Airborne Sound Insulation in Multi-Family Buildings*

The traditional approach to designing for noise control (sound insulation) in multi-family wood-frame buildings usually fails to address important aspects of how sound is transmitted. Canadian and U.S. building codes consider only the Sound Transmission Class (STC) rating of the assembly separating adjacent dwellings. But such an approach does not ensure satisfactory sound insulation between units because it fails to consider flanking transmission, the structure-borne sound transmission that bypasses the separating wall and travels through other building elements. This Update explains how an emphasis on system performance (the combined performance of the separating wall and floor assemblies and all the elements coupled to those assemblies) can achieve good sound insulation in multi-family buildings in a cost-effective manner.

## *No. 67. Repointing Mortars for Older Masonry Buildings—Design Considerations*

The repointing of mortar joints in older masonry buildings is generally undertaken as part of a regular maintenance or rehabilitation program to restore the ability of the masonry to control water ingress and preserve its historical authenticity. Permanent damage to masonry walls and premature failure of repointing work can result from improper selection and application of repointing mortars. This Update describes key design elements for achieving successful repointing of masonry walls to provide a longer service life for both the masonry units and the mortar. Because the restoration of older masonry buildings is a relatively new field in Canada, the design team should consider engaging a masonry conservation specialist to assist with the work.

## *No. 68. Repointing Mortars for Older Masonry Buildings—Site Considerations*

The proper application of repointing mortars is critical to the success of any masonry restoration project. This Update expands on a previous Update (which covers design and selection considerations) by reviewing the key site considerations for repointing, including scheduling of the work, qualifications of the workers, preparation of the mortar joint, mixing, application of the mortar, and curing. The specifications for a project should describe in detail what is expected in each of these areas. Repointing of older buildings involves the use of low-strength mortars which have different considerations than mortars used for modern construction and hence due diligence is required.

**These Updates are available free on the NRC-IRC Web site at: http://irc.nrc-cnrc.gc.ca/ctus**

You can also order printed versions through the NRC Virtual Store: http://www.nrc-cnrc.gc.ca/virtualstore/

Accessing the NRC-IRC Web site for these new Updates is a good opportunity to browse for many other publications that are available free of charge. Start with our main Publications page at: http://irc.nrc-cnrc.gc.ca/pubs/index_e.html. From here you can also search a database containing all publications since our founding in 1947. More than 2,500 are available in full-text, with new publications added weekly.

***Check our Web site regularly for new Updates!***

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## Publications

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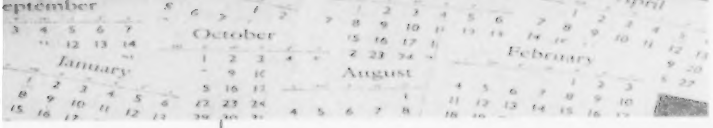

# Upcoming events

## JULY

**22-27**
American Society of Civil Engineering's International Pipelines Conference. Atlanta, GA. http://content.asce.org/conferences/pipelines2008/index.html

## AUGUST

**17-20**
American Public Works Association Public Works Congress and Exhibition. New Orleans, LA. http://www.apwa.net/meetings/congress/2008/

## SEPTEMBER

**21-25**
SB08 Melbourne – World Sustainable Building Conference. Melbourne. http://www.sb08melbourne.org/

**23-26**
Protecting our Water: Western Canada Water and Wastewater Association 60th Anniversary Conference. Regina. http://wcwwa.ca/2008/2008wcwwa.htm

**25-27**
Architectural Engineering Institute Conference. Denver. http://content.asce.org/conferences/aei08/

## OCTOBER

**4-5**
ICCREM 2008: International Conference on Construction and Real Estate Management. Toronto. http://www.iccrem.com/

**13-17**
Association for Preservation Technology International (APT). Montreal. http://www.apti.org/conferences/conference-future.cfm

## NOVEMBER

**2-6**
American Concrete Institute Fall Convention. St. Louis, MO. http://www.concrete.org/Convention/fall-Convention/Front.asp

**4-5**
* Construct Calgary + HomeBuilder and Renovator Expo. Calgary. http://www.constructcalgary.com/

**5**
* Expo-Contech. Montreal. http://www.contech.qc.ca/eng/index_batiment.php

**19**
* Expo-Contech. Quebec City. http://www.contech.qc.ca/eng/index_batiment.php

## DECEMBER

**3-5**
* Construct Canada. Toronto. http://www.constructcanada.com/index2008.htm

**3-5**
Homebuilder & Renovator Expo. Toronto. http://www.homebuilderexpo.ca/

## 2009 JANUARY

**26-28**
International Air-Conditioning, Heating, Refrigerating Exposition (AHR Expo). Chicago. http://www.ahrexpo.com/

## FEBRUARY

**11-12**
* BC Construction Show. Vancouver. http://www.bcconstruct.com/

**** You are invited to visit the NRC-IRC booth for more information about our research expertise.***

**This calendar does not include all events scheduled to take place during this time frame. For a more complete listing, see the Web version of "Upcoming events" at http://irc.nrc-cnrc.gc.ca/events_e.html**


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